



Warm up Grade 6

Date: Nov. 27



1) Find the product of each and use estimation to predict decimal place.

a) 17.87×7

$$\begin{array}{r}
 \overset{5}{1} \overset{6}{7} \overset{4}{.} \overset{Act}{8} \overset{7}{7} \\
 \times \\
 \hline
 125.09
 \end{array}$$

$$\left. \begin{array}{l}
 \text{Est} \\
 \hline
 18 \\
 \times 7 \\
 \hline
 140
 \end{array} \right\} \begin{array}{l}
 0 \sim 20 \\
 \times 7 \\
 \hline
 140
 \end{array}$$

b) 123.45×4

$$\begin{array}{r}
 \overset{1}{1} \overset{2}{2} \overset{3}{3} \overset{4}{.} \overset{5}{4} \overset{5}{5} \\
 \times \\
 \hline
 493.80 \\
 \text{Actual}
 \end{array}$$

$$\begin{array}{r}
 \text{Est} \\
 120 \\
 \times 4 \\
 \hline
 480 \\
 \text{Est}
 \end{array}$$

Homework Solutions

5. Estimate to choose the correct product for each multiplication question.

	Question	Possible Products		
a)	2.85×3	855	85.5	8.55
b)	12.36×4	494.4	49.44	4.944
c)	148.73×5	7.4365	74.365	743.65

- a. $3 \times 3 = 9$ (the correct answer is 8.55)
 b. $12 \times 4 = 48$ (the correct answer is 49.44)
 c. $149 \times 5 = 100 \times 5 = 500$
 $40 \times 5 = 200$
 $9 \times 5 = 45$
 $\underline{745}$ (the correct answer is 743.65)

6. Elisa works in a hospital lab in Brandon, Manitoba.
 In 1 h, she tested 7 tubes of blood.
 Each tube contained 12.25 mL of blood.
 How much blood did Elisa test?
 How did you find out?

$$\begin{array}{r} 12.25 \\ \times 7 \\ \hline 85.75 \end{array}$$

Elisa tested 85.75mL of blood

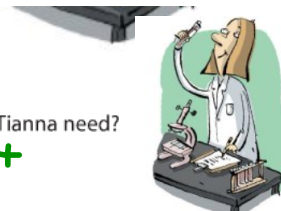
7. Naja saved \$14.75 each week for 8 weeks.
 She had just enough money to buy a family membership to the Vancouver Aquarium. About how much was the cost of the membership?

Step 1: $14.75 \times 8 =$ (need to know that it is a multiplication question)

Step 2: $15 \times 8 = 10 \times 8 = 80$
 $5 \times 8 = 40$
 $\underline{120}$

Step 3: The cost of the membership was about \$120

8. Tianna has saved \$9.75 each week for 7 weeks.
 She wants to buy a snowboard that costs \$80.45, including tax.
 a) Does Tianna have enough money? How do you know?
 b) If your answer to part a is no, how much more money does Tianna need?



a) $\$9.75 \times 7 = 68.25$ (Needs 2 places)

No Tianna only has \$68.25

b) $\$80.45$
 $-\$68.25$
 $\underline{\$12.20}$

Tianna needs \$12.20 more

Homework Solutions

9. The decimal point in some of these products is in the wrong place. Identify the mistakes, then write each product with the decimal point in the correct place.

a) $4.01 \times 5 = 200.5$

b) $7.893 \times 3 = 23.679$

c) $89.85 \times 4 = 35.94$

d) $1.98 \times 3 = 0.594$

9 a) $4.01 \times 5 = 200.5$

9 b) $7.893 \times 3 = 23.679$

Step 1: $4 \times 5 = 20$

Step 1: $7 \times 3 = 21$

Step 2: the decimal should be 20.05 not 200.5

Step 2: the decimal is correct

9 c) $89.85 \times 4 = 35.94$

9 d) $1.98 \times 3 = 0.594$

Step 1: $90 \times 4 = 360$

Step 1: $2 \times 3 = 6$

Step 2: the decimal should be 359.4

Step 2: the decimal should be 5.94



10. a) Akuna sold three 1.375-L bottles of birch syrup to raise money for his school in Hay River.

Did Akuna sell more or less than 4 L of syrup? How much more or less? Explain how you know.

b) Akuna sold each bottle of syrup for \$74.79. How much money did he raise?

$$\begin{array}{r} 1.375 \\ \times \quad 3 \\ \hline 4.125 \end{array}$$

EST
→ 1
 $\frac{x3}{3}$

He sold 4.125 L which is more than 4 L.

$$\begin{array}{r} 74.79 \\ \times \quad 3 \\ \hline 224.37 \end{array}$$

EST
→ 100
 $\frac{x3}{300}$

He raised \$224.37 for selling 3 bottles of maple syrup

11. The Townsend's big-eared bat lives in river valleys in southern British Columbia. It has a mass of 8.812 g. What is the combined mass of 6 of these tiny bats?



$$\begin{array}{r} 8.812 \\ \times \quad 6 \\ \hline 52.872 \end{array}$$

EST
8
 $\frac{x6}{48}$

The combined mass of 6 bats is 52.872 g

12. Write a story problem that can be solved by multiplying 4.026 by 7.
Trade problems with a classmate and solve your classmate's problem.

Many answers

Homework Solutions

13. You can estimate how tall a child will be as an adult by doubling her height at 2 years of age.
Serena is 2 years old and 81.4 cm tall.
About how tall will Serena be as an adult?

$$\begin{array}{r} \$81.4 \\ \times \quad 2 \\ \hline 162.8 \end{array}$$

$$\text{Est } 80 \times 2 = 160$$

$$\times \quad 2$$

$$162.8$$

Serena will be about 160 cm tall as an adult

14. The Three Dog Bakery in Vancouver sells bags of all-natural chicken-flavoured dog food for \$7.95 each. Saima buys 3 bags.
- Saima gives the cashier \$25.00.
How much change should she receive?
 - Each bag has a mass of 2.268 kg.
Does Saima have more or less than 7 kg of dog food altogether? How do you know?



Step 1: $7.95 \times 3 =$

Step 2: $8 \times 3 = 24$ (estimation)

$$\begin{array}{r} \text{Step 3: } 795 \times 3 = \quad 700 \times 3 = 2100 \\ \quad \quad \quad 90 \times 3 = \quad 270 \\ \quad \quad \quad 5 \times 3 = \quad \underline{15} \\ \quad \quad \quad \quad \quad 2385 \end{array}$$

Step 4: $7.95 \times 3 = 23.85$ (I know where to put my decimal because of my estimation)

Step 5 (Question a)

$$\begin{array}{r} 25.00 \\ - 23.85 \\ \hline 1.15 \end{array}$$

She should receive \$1.15 in change

Step 6: (Question b)

$2.268 \text{ kg each} \times 3$ (he bought 3 bags) =

$2 \times 3 = 6$ (estimation)

$$\begin{array}{r} 2268 \times 3 = 2000 \times 3 = 6000 \\ \quad \quad \quad 200 \times 3 = \quad 600 \\ \quad \quad \quad 60 \times 3 = \quad 180 \\ \quad \quad \quad 8 \times 3 = \quad \underline{24} \\ \quad \quad \quad \quad \quad 6812 \end{array}$$

$2.268 \times 3 = 6.812$ (I knew where to put the decimal because of my estimation)

Saima has **less** than 7 kg of dog food.



You will need a calculator.

Copy and complete the multiplication statements.

Use a calculator to find the products in the 2nd and 3rd columns.

$1 \times 1 = 1$	$0.1 \times 1 = 0.1$	$0.01 \times 1 = 0.01$
$1 \times 2 = 2$	$0.1 \times 2 = 0.2$	$0.01 \times 2 = 0.02$
$1 \times 3 = 3$	$0.1 \times 3 = 0.3$	$0.01 \times 3 = 0.03$
$1 \times 4 = 4$	$0.1 \times 4 = 0.4$	$0.01 \times 4 = 0.04$
$1 \times 5 = 5$	$0.1 \times 5 = 0.5$	$0.01 \times 5 = 0.05$
$1 \times 6 = 6$	$0.1 \times 6 = 0.6$	$0.01 \times 6 = 0.06$
$1 \times 7 = 7$	$0.1 \times 7 = 0.7$	$0.01 \times 7 = 0.07$
$1 \times 8 = 8$	$0.1 \times 8 = 0.8$	$0.01 \times 8 = 0.08$
$1 \times 9 = 9$	$0.1 \times 9 = 0.9$	$0.01 \times 9 = 0.09$
	$0.1 \times 10 = 1.0$	$0.01 \times 10 = 0.1$

► Describe the patterns you see.

When you multiply a whole number by a decimal smaller than 1, the product will always be less than the whole number

Don't copy

$$0.8 \times 2 = 1.6$$

Product is less than the whole number

When you multiply a decimal by a whole number the product will be less than the whole number.

Handwritten multiplication of 0.8 by 2. The vertical multiplication shows 0.8 times 2 equals 1.6. A red arrow points from the word 'est' to the decimal point in 0.8. To the right, a simple multiplication shows 1 times 2 equals 2.

http://www.virtualnerd.com/tutorials/?id=Gr6_03_01_0022

Ch. 3 Lesson 4

Multiply decimals LESS THAN 1 by a whole number

$$0.47 \quad \times \quad 8$$

When multiplying decimals, you do NOT line up decimal places BUT you line up numbers on top of each place

$$\begin{array}{r} 0.47 \\ \times 8 \\ \hline \end{array}$$

Step 1) Ignore the decimals until the end and multiply 47 x 8 (Show work)

|

40	7	
40 x 8	7 x 8	8
320	56	

Or area model

$$\begin{array}{r} 320 \\ + 56 \\ \hline 376 \end{array}$$

so

Step 2) To replace the decimal, there are two methods



Method 1) Estimate! This will help you place your decimal

0.47 is close to $\frac{1}{1}$

Estimation: $\frac{0.47 \times 8}{1 \times 8 \approx 8}$

My answer should be around 8 but this is an Overestimate

So $0.47 \times 8 = \underline{3.76}$ since it is close to 8

OR



Method 2) count the TOTAL number of digits after the decimal place in your original questions

0.47 Has 2 number after the decimal point

$\times 8$ has 0 numbers after the decimal place

Now add decimal places

2



My answer should have 2 number after the decimal place

3.76

Be careful with this method. Numbers ending with 5 or zero does b/c some leave the place holder off. (Tricky when ask to estimate where decimal goes for $0.75 \times 6 = 4.5$)

$$0.52 \times 3$$

$$\downarrow \times 3 = 3$$

1. Change decimal to a whole number (do this whether the decimal is greater or less than 0)

$$\begin{array}{r} 52 \\ \times 3 \\ \hline 156 \end{array}$$

Or

Area model



2. Estimate to place your decimal:

0.52 rounded up would be 1 (over est)

$$\underline{1} \times 3 = \underline{3} \text{ (over estimate)}$$

Move the decimal so that the product is close to 3

$$0.52 \times 3 = \underline{1.56}$$

- To multiply 0.0138 by 9, multiply the whole numbers: 138×9

$$\begin{array}{r} 138 \\ \times 9 \\ \hline 72 \\ 270 \\ \hline 900 \\ 1242 \end{array}$$

Estimate to place the decimal point.

So, $0.0138 \times 9 = 0.1242$

To estimate, I use compatible numbers.
 0.0138 is close to 0.01.
 0.01 is 1 hundredth.
 One hundredth multiplied by 9 is 9 hundredths.
 Nine hundredths are close to 10 hundredths, or 1 tenth.
 Place the decimal point so the product is close to 1 tenth; that is:
 0.1242



$$0.0678 \times 3$$

1. Change the decimal to a whole number (benchmark)

$$\begin{array}{r} \overset{2}{6} \overset{1}{7} \overset{1}{8} \\ \times \quad 3 \\ \hline 0.2034 \end{array}$$

2. Estimate to place your decimal

$$\begin{array}{r} 0.0678 \\ \times \quad 3 \\ \hline \end{array} \xrightarrow{\text{Not a good est}} \begin{array}{r} 0.1 \\ \times 3 \\ \hline 0.3 \end{array} \begin{array}{l} \text{smaller} \\ \text{smaller than 3} \end{array}$$

page 101

Class / Homework

#1ad

#2ad (No chart)

#4a

#6a,b,c

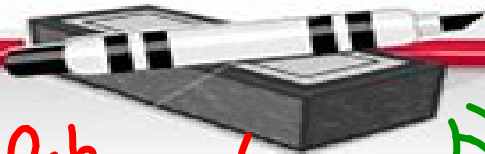
~~#7~~

1a)

$$\begin{array}{r} 0.6 \\ \times 4 \\ \hline 2.4 \end{array}$$

$$\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$$

b)



Practice



1. Use Base Ten Blocks.

Multiply.

a) 0.6×4

b) 0.12×3

c) 0.21×2

d) 0.34×5

e) 0.215×3

f) 0.408×2

2. Copy this place-value chart.
Multiply. Record each product in the chart.

Ones	Tenths	Hundredths	Thousandths	Ten- Thousandths

- a) 0.005×7 b) 0.42×9 c) 0.029×5
d) 0.0328×9 e) 0.276×6 f) 0.1036×8

3. Multiply. Describe your strategies.

a) 0.9×3

0.09×3

0.009×3

b) 0.25×6

0.025×6

0.0025×6

c) 0.018×4

0.0018×4

0.00018×4

What patterns do you see?

a. $9 \times 3 = 27$ (est)

$0.9 \times 3 = 2.7$

$0.09 \times 3 = 0.27$

$0.009 \times 3 = 0.027$

b. $25 \times 6 = 20 \times 6 = 120$

$$\begin{array}{r} 5 \times 6 = 30 \\ \hline 150 \end{array}$$

$0.25 \times 6 = 1.50$

$0.025 \times 6 = 0.150$

$0.0025 \times 6 = 0.0150$

c. $18 \times 4 = 72$

$0.018 \times 4 = 0.072$

$0.0018 \times 4 = 0.0072$

$0.00018 \times 4 = 0.00072$

4. Shona cut a ribbon into 8 equal lengths to finish sewing her Fancy Shawl Regalia. Each piece was 0.158 m long.
- How long was the ribbon before Shona cut it?
 - How many cuts did she make?



Woman Dancing an Aboriginal Fancy Dance

5.

Juice	Vitamin C per glass (g)
Pure Orange Juice	0.054
Pure Apple Juice	0.0009

- a) Stefan drinks a glass of pure orange juice
How much Vitamin C does Stefan get from orange juice each week?
- b) Stefan went to Sasamat Outdoor Centre's overnight camp for one week.
He drank a glass of pure apple juice each morning with his breakfast.
How much Vitamin C did Stefan get from apple juice that week?



6. Without multiplying, choose the correct product for each multiplication question.

Explain your choice each time. Multiply to check.

	Question	Possible Products		
a)	0.063×9	5.67	0.567	0.0567
b)	0.349×7	2.443	0.2443	0.024 43
c)	0.0078×5	0.39	0.039	0.0039



7. Multiply as you would whole numbers. Estimate to place the decimal point.

a) 0.359×5 b) 0.0112×9 c) 0.083×4

d) 0.89×6 e) 0.0063×7 f) 0.097×8

a. $359 \times 5 =$ $300 \times 5 = 1500$
 $50 \times 5 = 250$
 $9 \times 5 = \underline{45}$
 1795

$0359 \times 5 = 1.795$

b. $0.0112 \times 9 =$ $100 \times 9 = 900$
 $10 \times 9 = 90$
 $2 \times 9 = \underline{18}$
 1008

$0.0112 \times 9 = 0.1008$

8. A student said that since $11 \times 5 = 55$, then 0.0011×5 is 0.55.
Is the student's reasoning correct?
Give reasons for your answer.

Reflect

How can you use your knowledge of multiplication facts to help you multiply a decimal less than 1 by a 1-digit whole number?